

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A swing-type display device for, ~~when swung,~~ displaying, when swung, an image in a trajectory of the swing, by utilizing persistence of vision, comprising:

a linear array of first light-emitting elements, capable of emitting light in a predetermined color, the linear array extending in a direction substantially perpendicular to the direction of the swing;

a linear array of second light-emitting elements, capable of emitting light in a color which is different from the predetermined color, the first light-emitting elements and the second light-emitting elements being arranged in pairs of two, such that each second light-emitting element is disposed near a corresponding one of the first light-emitting elements; and

a control section ~~for which activating activates~~ each of the first and second light-emitting elements, for a predetermined period, to emit light in a luminance level in accordance with image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing-, the displayed image appearing as a mixed color formed from the predetermined color of the emitted light from the first light-emitting elements and the color of the emitted light from the second light-emitting elements.

2. (original) The swing-type display device according to claim 1, wherein the predetermined period is equal to a period for displaying a single pixel of the image.

3. (original) The swing-type display device according to claim 1, wherein the first and second light-emitting elements of each pair are located side by side in the direction of the swing.

4. (currently amended) A swing-type display device for displaying, when swung, an image in a trajectory of the swing, by utilizing persistence of vision, comprising:

a linear array of first light-emitting elements, capable of emitting light in a predetermined color, the linear array extending in a direction substantially perpendicular to the direction of the swing;

a linear array of second light-emitting elements, capable of emitting light in a color which is different from the predetermined color, the first light-emitting elements and the second light-emitting elements being arranged in pairs of two, such that each second light-emitting element is disposed near a corresponding one of the first light-emitting elements;

a control section which activates each of the first and second light-emitting elements, for a predetermined period, to emit light in a luminance level in accordance

with image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing; and

~~The swing-type display device according to claim 1, further comprising an optical guide composed of~~comprising a light-transmitting material, the optical guide covering light-emitting surfaces of the first and second light-emitting elements and allowing the light emitted from the light-emitting surfaces of the first and second light-emitting elements to propagate therethrough to outside of the swing-type display device,

wherein, the optical guide includes a first face opposing the light-emitting surfaces of the first and second light-emitting elements, and a second face opposite from the first face, the second face being matte-finished to diffuse the light propagating through the optical guide.

5. (currently amended) The swing-type display device according to claim 4, wherein a groove is formed₂ on the first face of the optical guide, in a position opposing each of ~~boundaries~~boundary between adjacent pairs of first and second light-emitting elements.

6. (currently amended) The swing-type display device according to claim 1,

wherein, ~~the control section is operable to drive~~ each of the first and second light-emitting elements is a light-emitting element driven by a respective PWM signal, and the

mixed color results from the respective PWM signals driving the first and second light-emitting elements, ~~for the predetermined period by a PWM technique using a pulse having a frequency based on the image data, and~~
~~the frequency takes at least two values in accordance with the image data.~~

7. (currently amended) The swing-type display device according to claim 1,

wherein, ~~the control section is operable to drive each of the first and second light-emitting elements~~ is a light-emitting element driven by a respective variable current or voltage signal, and the mixed color results from levels of the respective variable current or voltage signals driving the first and second light-emitting elements, ~~for the predetermined period with a current or voltage based on the image data, and~~
~~the current or voltage takes at least two values in accordance with the image data.~~

8. (currently amended) A swing-type display device for displaying, when swung, an image in a trajectory of the swing, by utilizing persistence of vision, comprising:

a linear array of first light-emitting elements, capable of emitting light in a predetermined color, the linear array extending in a direction substantially perpendicular to the direction of the swing;

a linear array of second light-emitting elements, capable of emitting light in a color which is different from the predetermined color, the first light-emitting elements and the second light-emitting elements being arranged in pairs of two, such that each second light-emitting element is disposed near a corresponding one of the first light-emitting elements;

a control section which activates each of the first and second light-emitting elements, for a predetermined period, to emit light in a luminance level in accordance with image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing; and

~~The swing-type display device according to claim 1, further comprising a tilt sensor for which detecting detects~~ a tilt of the swing-type display device,

wherein, the tilt sensor includes a ball which is capable of reciprocating between a first position and a second position in synchronization with the swing of the swing-type display device, and

the control section is operable to begin activating each of the first and second light-emitting elements each time the ball is moved out of the first or second position.

9. (currently amended) The swing-type display device according to claim 3, wherein the control section is operable to control one of the first and second light-emitting elements of each pair ~~that~~ which is located more to a rear along the direction of the swing of the swing-type display device, to be activated a predetermined

time later than the other light-emitting element which is located more to a front along the direction of the swing of the swing-type display device.

10. (currently amended) A swing-type display device for, when swung, displaying an image in a trajectory of the swing by utilizing persistence of vision, comprising:

a linear array of light-emitting elements, the linear array extending in a direction substantially perpendicular to the direction of the swing;

a control section for activating each of the light-emitting elements for a predetermined period, to emit light in a luminance level in accordance with image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing;

partitions, each provided between adjacent ones of the light-emitting elements, for restricting directions of light output from light-emitting surfaces of the light-emitting elements; and

a covering member provided to cover the light-emitting elements and the partitions, the covering member ~~being composed of~~ comprising a light-transmitting material,

wherein,

the covering member includes a first face opposing the light-emitting surfaces of the light-emitting elements, and a second face opposite from the first face, and

the swing-type display device further comprises a plurality of convex portions, formed on at least one of the first and second faces, each shaped as a ridge extending along the direction of the swing.

11. (original) The swing-type display device according to claim 10, wherein the convex portion has a lenticular-lens-like or wedge-like configuration.

12. (currently amended) The swing-type display device according to claim 11, wherein a plurality of said partitions are formed in a light-emitting area₁ on the second face₂ which is attributable to each of the light-emitting elements.

13. (currently amended) The swing-type display device according to claim 10,
wherein,
the convex portions are formed on the first face, and
the covering member is disposed so as to leave a predetermined space between the covering member and~~from~~ the partitions.

14. (currently amended) The swing-type display device according to claim 13, wherein the ~~covering members~~convex portions are formed at least on portions of the first face opposing the partitions.

15. (original) The swing-type display device according to claim 10, wherein the predetermined period is equal to a period for displaying a single pixel of the image.

16. (currently amended) The swing-type display device according to claim 10, wherein,

the control section is operable to drive each of the light-emitting elements for the predetermined period, by a PWM technique using a pulse having a frequency based on the image data, and

the frequency takes at least three values in accordance with the image data.

17. (currently amended) The swing-type display device according to claim 10,

wherein,

the control section is operable to drive each of the light-emitting elements for the predetermined period, with a current or voltage based on the image data, and

the current or voltage takes at least three values in accordance with the image data.

18. (currently amended) The swing-type display device according to claim 10, further comprising a tilt sensor ~~for which detecting detects~~ a tilt of the swing-type display device,

wherein,

the tilt sensor includes a ball which is capable of reciprocating between a first position and a second position, in synchronization with the swing of the swing-type display device, and

the control section is operable to begin activating each of the light-emitting elements each time the ball is moved out of the first or second position.

19. (new) A method for displaying, by utilizing persistence of vision, an image in a trajectory of a swing of a swung swing-type display device, comprising:

providing a plurality of light-emitting element sets, each of which comprises a plurality of light-emitting elements, each of the plurality of elements in a set being disposed near the each of the other of the plurality of elements in the set, the plurality of light-emitting element sets being aligned in a linear array of sets substantially perpendicular to the swing direction;

providing a control section which activates each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with image data; and

causing each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with the image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing, the displayed image appearing as a mixed color formed from a first color of emitted light from light-emitting elements of one of the plurality of light-emitting element sets and a second color

which is different from the first color, of emitted light from light-emitting elements of another one of the plurality of light-emitting element sets.

20. (new) The method according to claim 19, wherein the predetermined period is equal to a period for displaying a single pixel of the image.

21. (new) A method for displaying, by utilizing persistence of vision, an image in a trajectory of a swing of a swung swing-type display device, comprising:

providing a plurality of light-emitting element sets, each of which comprises a plurality of light-emitting elements, each of the plurality of elements in a set being disposed near the each of the other of the plurality of elements in the set, and the plurality of light-emitting element sets being aligned in a linear array of sets substantially perpendicular to the swing direction;

providing a control section which activates each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with image data;

causing each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with the image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing; and

providing an optical guide comprising a light-transmitting material, the optical guide covering light-emitting surfaces of the light-emitting elements in each set and

allowing the light emitted from the light-emitting surfaces of the light-emitting elements to propagate therethrough to outside of the swing-type display device,

wherein the optical guide includes a first face opposing the light-emitting surfaces of the light-emitting elements, and a second face opposite from the first face, the second face being matte-finished to diffuse the light propagating through the optical guide.

22. (new) The method according to claim 21, further comprising forming a groove on the first face of the optical guide, in a position opposing each boundary between adjacent sets of light-emitting elements.

23. (new) The method according to claim 19,
wherein the control section is operable to drive each of the light-emitting elements in each set for the predetermined period by a PWM technique using a pulse having a frequency based on the image data to display the image; and
the frequency takes at least two values in accordance with the image data.

24. (new) The method according to claim 19,
wherein the control section drives each of the light-emitting elements of each set for the predetermined period with a current or voltage based on the image data to display the image; and
the current or voltage takes at least two values in accordance with the image data.

25. (new) A method for displaying, by utilizing persistence of vision, an image in a trajectory of a swing of a swung swing-type display device, comprising:

providing a plurality of light-emitting element sets, each of which comprises a plurality of light-emitting elements, each of the plurality of elements in a set being disposed near the each of the other of the plurality of elements in the set, and the plurality of light-emitting element sets being aligned in a linear array of sets substantially perpendicular to the swing direction;

providing a control section which activates each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with image data;

causing each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with the image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing providing a tilt sensor which detects a tilt of the swing-type display device; and

wherein the tilt sensor includes a ball which is capable of reciprocating between a first position and a second position in synchronization with the swing of the swing-type display device, and

the control section is operable to begin activating each of the light-emitting elements of each set, each time the ball is moved out of the first or second position.

26. (new) The method according to claim 19, wherein the control section is operable to control one of the light-emitting elements of each set which is located more to a rear along the direction of the swing of the swing-type display device, to be activated a predetermined time later than another light-emitting element which is located more to a front along the direction of the swing of the swing-type display device.

27. (new) A swing-type display device for displaying, when swung, an image in a trajectory of the swing, by utilizing persistence of vision, comprising:

a linear array of first light-emitting elements, capable of emitting light in a predetermined color, the linear array extending in a direction substantially perpendicular to the direction of the swing;

a linear array of second light-emitting elements, capable of emitting light in a color which is different from the predetermined color, the first light-emitting elements and the second light-emitting elements being arranged in pairs of two, such that each second light-emitting element is disposed near a corresponding one of the first light-emitting elements; and

a control section which activates each of the first and second light-emitting elements, for a predetermined period, to emit light in a luminance level in accordance with image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing, the image displayed having multiple colors.

28. (new) The swing-type display device according to claim 27,
wherein each of the first and second light-emitting elements is a light-emitting
element driven by a respective PWM signal, and the multiple colors result from the
respective PWM signals driving the first and second light-emitting elements.

29. (new) The swing-type display device according to claim 27,
wherein each of the first and second light-emitting elements is a light-emitting
element driven by a respective variable current or voltage signal, and the multiple colors
result from levels of the respective variable current or voltage signals driving the first and
second light-emitting elements.

30. (new) A method for displaying, by utilizing persistence of vision, an
image in a trajectory of a swing of a swung swing-type display device, comprising:

providing a plurality of light-emitting element sets, each of which comprises a
plurality of light-emitting elements, each of the plurality of elements in a set being
disposed near the each of the other of the plurality of elements in the set, and the plurality
of light-emitting element sets being aligned in a linear array of sets substantially
perpendicular to the swing direction;

providing a control section which activates each light-emitting element of each set,
for a predetermined period, to emit light in a luminance level in accordance with image
data; and

causing each light-emitting element of each set, for a predetermined period, to emit light in a luminance level in accordance with the image data, thereby displaying an image, corresponding to the image data, in the trajectory of the swing, the image displayed having multiple colors.

31. (new) The method according to claim 30,
wherein the control section is operable to drive each of the light-emitting elements in each set for the predetermined period, by a PWM technique using a pulse having a frequency based on the image data to display the image; and
the frequency takes at least two values in accordance with the image data.

32. (new) The method according to claim 30,
wherein the control section drives each of the light-emitting elements of each set for the predetermined period, with a current or voltage based on the image data to display the image; and
the current or voltage takes at least two values in accordance with the image data.

33. (new) The swing-type display device according to claim 6, further comprising a data table storing a correspondence between duty ratios of respective PWM signals driving the first and second light-emitting elements and the mixed color to be displayed.

34. (new) The swing-type display device according to claim 28, further comprising a data table storing a correspondence between duty ratios of respective PWM signals driving the first and second light-emitting elements and the mixed color to be displayed.